

Name _____

Air Pressure

Date _____

How strong are you? Believe it or not, right now you are supporting many many tons of weight. All of this weight is the Earth's Atmosphere pressing down on you from every direction. Air may seem like it doesn't weigh much, but it actually does. Every square inch of space around you has **14.7 pounds of air** pressing down on it (or, 1 kilogram per square centimeter).

Calculate how much pressure is on this square:

1. Measure the sides of the square.

Height: _____

Width: _____

2. Multiply the height by the width to find out how many square inches there are here:



3. Multiply the number of square inches by 14.7.

4. THAT is how many pounds of air pressure are on this square right now. Think of many squares like this it would take to cover your body. That's an awful lot of pressure on you!

So Why don't we all crumple up under all this pressure? The answer is that we are all in **balance**. We have air inside us—we breathe it in, and it goes all over our body, and that air is pushing back on all the pressure on the outside, so everything balances out and we don't even notice it. Air may seem light and harmless, but it has a lot of weight.



One student "blows up" another one. Using only air pressure, she lifts him off the ground!

How strong is your Breath?

No we're not selling breath mints. Air pressure is so powerful that it can be used to lift heavy loads. Sometimes rescue crews will use plastic bags filled with air to move parts of fallen buildings. At the Lawrence Livermore National Laboratory scientists understand air pressure so well that they know how to use a baggie, a straw, some sealant, and a board, to lift up heavy objects (like other people) just by using the breath a person exhales.

Air pressure is THAT strong!

A Vacuum is a place with no air in it. This means that there's no air pressure pressing against whatever may be inside the vacuum. Outer space is a vacuum. An astronaut needs a space suit out there to keep the air inside her from pushing outward too much and killing her! You've always got to keep the pressure, outside and in, equal! That's why your ears pop when you change air pressure zones. You're equalizing.



The Lawrence Livermore National Laboratory: Super Science!